REMARKS/ARGUMENTS

The Office Action mailed June 2, 2006 has been carefully considered. Reconsideration in view of the following remarks is respectfully requested.

Claims 2 – 34 are pending in the application. Claims 13, 20, 22, and 32 have been amended. Support for the amendments is found in the specification, drawings, and claims as originally filed. Applicants submit, therefore, that the amendments do not add new matter.

Rejection under U.S.C. § 102

Claim 32 was rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by U.S. Patent No. 5,456,341 to Garnjost et al. (Garnjost). Applicants respectfully submit that claim 32, as amended is not anticipated by Garnjost. Claim 32 includes the following limitations.

A device, comprising:
a user object, the user object movable by a user;
a sensor configured to detect a position of the user object and output a position signal, the position signal being based on the position of the user object; and
an actuator configured to receive an impulse-shaped force signal, said actuator configured to apply a force to the user object in accordance with the impulse-shaped force signal such that a force having an impulse magnitude value at a time, followed by a steady-state magnitude value different from the impulse magnitude value at a time different from the time associated with the impulse magnitude value, is applied to said user object.

(Amended claim 32) (Emphasis added)

Applicants respectfully submit that a manipulandum cannot be equated with the mass 23 of Garnjost as suggested by the Examiner. A manipulandum is an object that is manipulated (i.e., moved manually). To clarify this limitation, applicants have substituted the term "user object" for the term "manipulandum". Support for this substitution is found in the specification at paragraph 11, lines 10 and 11.

The mass (23) of Garnjost is not a user object, but rather it is part of a mass-spring type force generator. In this regard, Garnjost discloses the following.

An actively-controlled resonant-type force generator (20) is adapted to be attached to a structure (21), and includes a mass (23) mounted for movement relative to the structure and a plurality of springs (22, 24) operatively arranged between the mass and the structure. A servoactuator (26) is arranged to controllably excite the mass-spring system. The actual force (F.sub.a) transmitted from the mass to the structure is compared with a commanded force (F.sub.c) to produce a force error signal (F.sub.e). The actuator is caused to produce a velocity as a function of the error signal. The gain of the closed force loop is selected so that the resonance of the mass-spring system has an effective damping ratio (.zeta.) greater than about 0.5, and preferably about 0.7. Thus, the mass-spring system will not be substantially resonantly excited by vibrations of the structure near its resonant frequency (.omega..sub.n).

(Garnjost, Abstract) (Emphasis added)

Garnjost further discloses:

With parenthetical reference to the corresponding structure of the first preferred embodiment (i.e., as shown in FIG. 1) for exemplary purposes only, and not by way of limitation, this invention provides, in one aspect, an active resonant inertial force generator (20) which is adapted to be attached to a structure (21), such as a helicopter fuselage. The improved force generator broadly includes: a mass (23) mounted for movement relative to the structure; at least one spring (22, 24) operatively arranged between the mass and the structure; an actuator (26); the mass, the spring and the actuator being connected mechanically in series, with the spring and the actuator being arranged between the mass and the structure; command means (41) for generating an oscillatory force command signal (F.sub.c); transducer means (a.sub.1) arranged to generate a feedback signal proportional to the force transmitted from the mass to the structure; means (40) for producing an error signal (F.sub.e) proportional to the difference between the command signal and the feedback signal; and control means (28) for causing the actuator to produce a velocity as a function of the error signal. In one preferred embodiment, the gain of the closed force loop is selected so that the resonance of the mass and the spring(s) has an effective damping ratio (.zeta.) greater than about 0.5, and preferably about 0.7, such that the mass and spring(s) will not be substantially resonantly excited by vibrations of the structure at or near the resonant frequency of the mass-spring system.

In another aspect, as shown in FIG. 2, the invention provides an active resonant absorber (45) which is adapted to generate a reactive damping force in response to vibrations of a structure on which it is mounted. The improved absorber includes a mass (23) mounted for movement relative to the structure; at least one spring (22, 24) operatively arranged between the mass and the structure; an actuator (26); the mass, the spring and the actuator being connected mechanically in series, with the spring and the actuator being arranged between the mass and the structure; transducer means (a.sub.1) arranged to generate a feedback signal proportional to the force transmitted from the mass to the structure; transfer function means (46) for modifying the force feedback signal which is provided to an amplifier; and actuator drive means (28). In the preferred embodiment of this form of the invention, the transfer function of the signal produced

by the force transducer means is selected so that the oscillatory motion of the actuator will cause a modification of the mass-spring system effective natural frequency to match the structural vibration frequency, such that the amplitude of the excited system will be maximized.

(Garnjost, col. 2, line 62 – col. 3, line 42) (Emphasis added)

Garnjost further discloses:

The present invention overcomes this problem by providing a closed force loop about the mass-spring system and the actuator so that its resonance will have an effective damping ratio of greater than about 0.5, and preferably about 0.7, as shown in FIG. 5. The physical characteristics of the mass and spring are unchanged. Hence, the mass-spring system may be designed (i.e., "tuned") to have its natural frequency equal the expected frequency of the external disturbance. The mass-spring system is synthetically damped in the closed force loop so that it closely follows a change in the forcing function.

(Garnjost, Abstract) (Emphasis added)

These portions of Garnjost make clear that the mass (23) of Garnjost is not a user object, movable by a user as claimed. The mass (23) of Garnjost is part of a mass-spring system for controlling vibratory forces transmitted from the mass to an adjoining structure.

For these reasons applicants respectfully submit that claim 32 is not anticipated nor rendered obvious by Garnjost. Given that claims 13 – 15, 21, 22, 26, 33, and 34 contain the same limitation, applicants respectfully submit that claims 13 – 15, 21, 22, 26, 33, and 34, are, likewise, not anticipated or rendered obvious by Garnjost.

In regard to claim 34, applicants respectfully submit that a steady-state magnitude value higher than the impulse magnitude is fundamental to the underlying purpose of Garnjost. It would not, therefore have been obvious in view of Garnjost to have a steady-state magnitude value lower than the impulse magnitude value. Garnjost does not disclose or suggest such limitation, and in fact, teaches away from such.

Conclusion

It is believed that this Amendment places the above-identified patent application into condition for allowance. Early favorable consideration of this Amendment is earnestly solicited.

If, in the opinion of the Examiner, an interview would expedite the prosecution of this application, the Examiner is invited to call the undersigned attorney at the number indicated below.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case. Please charge any additional required fee or credit any overpayment not otherwise paid or credited to our deposit account No. 50-1698.

Respectfully submitted,

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